

imum velocities are averages for 5 minutes; extreme velocities are gusts of shorter duration:

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
		Miles.				Miles.	
Amarillo, Tex.	5	50	w.	Galveston, Tex.	24	50	nw.
Atlantic City, N. J.	30	52	w.	Hatteras, N. C.	30	50	w.
Block Island, R. I.	12	50	nw.	Havre, Mont.	13	50	sw.
Do	13	50	nw.	Kittyhawk, N. C.	25	52	n.
Do	16	50	ne.	Nantucket, Mass.	27	52	ne.
Do	17	54	ne.	Do	29	55	se.
Do	29	68	e.	Do	30	51	nw.
Do	30	66	nw.	Pikes Peak, Colo.	1	84	w.
Boston, Mass.	29	51	ne.	Do	6	80	w.
Chicago, Ill.	20	51	s.	Do	7	97	w.
Cleveland, Ohio	11	54	w.	Do	16	80	w.
Do	12	52	w.	Do	20	102	w.
Colorado Springs, Colo.	16	60	sw.	Do	24	82	nw.
Do	20	73	nw.	Do	28	84	nw.
Do	21	63	nw.	Portland, Oregon.	13	50	sw.
Do	28	53	nw.	Tatoosh Island, Wash.	12	58	s.
Eastport, Me.	29	57	ne.	Do	13	62	s.
Do	30	78	ne.	Do	15	60	w.
Fort Canby, Wash.	11	51	s.	Do	17	52	s.
Do	12	91	s.	Do	23	50	e.
Do	13	90	s.	Williston, N. Dak.	10	54	w.
Do	14	72	s.	Winnemucca, Nev.	1	52	sw.
Do	15	78	sw.	Woods Holl, Mass.	12	62	nw.
Do	17	84	se.	Do	13	59	nw.
Do	18	52	sw.	Do	25	52	nw.
Do	19	56	sw.	Do	30	68	nw.
Do	25	52	s.				

LOCAL STORMS.

5th.—During a thunderstorm at Gordonville, Mo., a house was struck by lightning.

7th.—A rainstorm began at Norfolk, Va., at 6.05 a. m., and ended at 4.10 p. m. A vessel was wrecked about 1 mile south of Little Island Life-Saving Station.

12th.—A windstorm, with a maximum velocity of 36 miles per hour, occurred at Baltimore, Md.; the roof of the city jail was blown off. At Olympia, Wash., high south winds and heavy rain prevailed during the 12th and 13th. The storm was reported very severe down Puget Sound, and electric wires were badly damaged. At Astoria, Oreg., rain occurred at intervals during the 12th, with high south winds, increasing in the late afternoon to a violent gale. The rain continued until 2.45 p. m.; 13th, began again at 7 p. m., and continued throughout the day. The storm was the most severe in a number of years, and damaged buildings and electric wires.

15th.—At Seattle, Wash., rain fell at intervals during the day, accompanied by high winds in the evening, attaining a maximum velocity of 37 miles per hour from the south at 7.30 p. m. Much damage was done to shipping; electric wires were prostrated; and washouts and landslides occurred on railroads.

20th.—At Oxford, Fla., high winds and a thunderstorm damaged timber. A thunderstorm began at Abilene, Tex., at 11 p. m. of the 19th and continued until 1 a. m., 20th. The wind reached a maximum velocity of 48 miles per hour. Some damage was done to outbuildings. A tornado passed over Dallas and Oak Cliff, Tex. The whirling wind was accompanied by thunder and vivid and continuous lightning. One person was killed. Galveston, Tex., thunderstorm, 1 person killed by lightning.

27th.—Heavy snowstorms occurred over New England and New York, delaying traffic. At Provincetown, Mass., trees were broken from the weight of the snow and damage was done to electric wires. At Nantasket Beach, Mass., the coast was strewn with wreckage.

29-30th.—A severe gale and snowstorm prevailed over New England and the middle Atlantic States. At Eastport, Me., the storm began the evening of the 29th, and by 6.55 a. m. of the 30th the wind had reached a maximum velocity of 78 miles per hour and an extreme velocity of 90 miles. There was very little shipping in port, and the tide being unusually low, the damage was not very great. The storm was the most severe since the opening of the Weather Bureau station (April, 1873), and nothing equaling it has occurred since September, 1869. At Gloucester, Mass., a heavy south-east gale prevailed during the 29th; a vessel was wrecked near Eastern Point. All along the New England coast a number of vessels were damaged. At Atlantic City, N. J., the wind attained a maximum velocity of 52 miles per hour and an extreme velocity of 60 miles; damage was done to electric wires. Throughout New York and Pennsylvania the snow was exceptionally heavy, and caused great delay to traffic and damage to electric wires. At Baltimore, Md., the wind reached a maximum velocity of 48 miles per hour from the west. The storm was the most severe in years. One person was blown down and considerably injured and another injured by flying debris. Considerable damage was done to property.

ATMOSPHERIC ELECTRICITY.

THUNDERSTORMS AND AURORAS.

The table on page 20 shows in detail for January, 1894, the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month.

THUNDERSTORMS.

A mention of the more severe thunderstorms reported during the month is given under "Local storms." The dates on which reports of thunderstorms were most numerous are the 4th and 5th, 19th and 20th, 23d and 24th. The dates on which reports were least numerous are the 1st, 2d, 21st, 25th, 30th, and 31st. The States from which the most numerous reports were received were: Alabama, Illinois, Louisiana, Missouri, and Texas.

AURORAS.

The evenings on which bright moonlight must have interfered with observations were from the 17th to 25th. On the remaining twenty-three evenings 209 reports were received, or an average of 7 per day. The dates on which the reported

number especially exceeded this average were the 2d, 3d, 4th, and 11th. The display of the 3d was reported from 115 stations. The only date on which thunderstorms and auroras were especially numerous were the 3d and 4th, respectively, as though the maximum of thunderstorms occurred shortly after the maximum of auroras.

The following special descriptions of the auroras of the 3d and 11th have been received:

Maine.—Indian Stream, 3d, an aurora was first noticed at 7.43 p. m. The northern half of the heavens was then covered with pale clouds, with here and there a patch of red, and an occasional movement like a faint flash from the northern horizon to zenith. Cloudiness increased rapidly until 8.13 p. m., when the whole heavens, except a small space at the southwest horizon, were covered by faint luminous clouds, which faded rapidly.

Massachusetts.—Boston, 3d, a dim auroral glow was observed at 6.15 p. m., and continued until 9.15 p. m., when it was obscured by clouds. It was most brilliant at 7.40 p. m., when the diffused light reached near the zenith. East Templeton, 3d, a very fine aurora. Between 6 and 7 p. m. 6 or 7 dark red streamers to the east and north; about 8 p. m., 2 distinct arches; at midnight, obscured by clouds.

New York.—Buffalo, 3d, a faint aurora first observed as a diffused patch of red light about 45° east of north, altitude 60°. Waves of light of a whitish, yellow color seemed to move from east to west, and were observed near the zenith; no arch visible. Oswego, 3d, an aurora was observed from 7.40 to

7.55 p. m. and from 8.10 to 8.45 p. m. The display consisted of an irregular arch of diffused white light of 20° altitude and extending from northwest to east. Patches and waves of light reached to the zenith and were of a rose color, at times deepened to a ruby tint. The display was most brilliant at 7.45 p. m. From 8.10 to 8.45 p. m. the display consisted merely of an arch, and was very beautiful, as the colors were very strong. The display was observed in Syracuse.

District of Columbia.—Washington, 3d, an aurora was observed at 7.25 p. m. in the north, extending about 20° in azimuth toward the west. When first observed a few beams could be seen but soon blended into a diffused reddish light, which entirely disappeared at 8 p. m.

Minnesota.—St. Vincent, 3d, an aurora was observed at 8 p. m., which increased in brilliancy. Streamers extended from east to west, and reached the zenith in the shape of a cone. Later it formed a band on the horizon and disappeared about 10.30 p. m.

North Dakota.—Bismarck, 3d-4th, an aurora, consisting of an arch, with a dark segment below, from which occasional streamers would flash up to zenith, began at 7.20 p. m., 3d, and ended at 8 a. m., 4th. Altitude of summit of arch 40°, azimuthal span of arch 200°.

Montana.—Havre, 2-3d, an aurora began at 10.30 p. m., 2d. A pale, whitish light forming a broken auroral arch, altitude at crown of arch 30°,

azimuth of the ends, 100° to 260°. The display ended in the early morning of the 3d. Helena, 4th, an aurora, consisting of a pale, yellow light, with shooting beams and a well-defined dark segment, was observed from 12.10 a. m. to 1.25 a. m., when it was obscured by clouds. Altitude of the display 15°, shooting beams extended to 35°, azimuthal span of arch, 120°. Miles City, 11th, aurora visible from 8.30 p. m. to midnight, when observer retired. During greater part of evening it was merely a diffused light, but from 10.30 to 11 p. m., there were three successive arches superposed from the horizon upward at equal distances apart, and the apex of the uppermost arch was 45° in altitude and 60° azimuth, or span. The apices of the lower arches were directly under the apex of the uppermost, and the azimuthal span of the lowest was only one-third that of the uppermost. Three slender columns were seen in front of the aurora and about 50° in altitude. 12th, the aurora disappeared with the oncoming of daylight.

South Dakota.—Huron, 12th, a brilliant aurora was observed at intervals from 9.30 p. m. until after midnight. The form and appearance was very changeable. Sometimes numerous beams, reaching nearly to the zenith, prevailed and again the phenomenon was wholly a clearly-defined arch of white light over a very dark segment. The extremes of the display extended from about azimuth 140° to 220°, and altitude 75° to 80°. The beams were in constant motion and seemed to vibrate from side to side.

STATE WEATHER SERVICES.

[Temperature in degrees Fahrenheit; precipitation, including melted snow, in inches and hundredths.]

The following extracts and summaries are republished from reports for January, 1894, of the directors of the various state weather services:

ALABAMA.

Temperature.—The mean was 6.5 above the normal; maximum, 82, at Geneva, 7th; minimum, 3, at Florence and Newburg, 25th; greatest monthly range, 69 at Newburg; least monthly range, 45, at Eufaula and Oxanna.

Precipitation.—The average was 0.65 below the normal; greatest monthly, 9.38, at Newton; least monthly, 0.86, at Sturdevant.

Wind.—Prevailing direction, north.—F. P. Chaffee, Local Forecast Official, Weather Bureau, Montgomery, director.

ARIZONA.

Temperature.—Maximum, 84, at Parker, 26th; minimum, -19, at Flagstaff, 7th; greatest monthly range, 74, at Parker and Whipple Barracks; least monthly range, 40, at Peoria and Reymert.

Precipitation.—Greatest monthly, 2.00, at Flagstaff; least monthly, 0.00, at several stations.

Wind.—Prevailing direction, southwest.—W. Burrows, Observer, Weather Bureau, Tucson, director.

ARKANSAS.

Temperature.—The mean was 3.3 above the normal; maximum, 77, at Bee Branch and Fort Smith, 16th; minimum, -22, at Rogers, 24th; greatest monthly range, 97, at Rogers; least monthly range, 60, at Brinkley.

Precipitation.—The average was 1.08 below the normal; greatest monthly, 8.58, at Hamburg; least monthly, 1.48, at Conway.

Wind.—Prevailing direction, south.—F. H. Clarke, Local Forecast Official, Weather Bureau, Little Rock, director; G. G. Harkness, Observer, Weather Bureau, assistant.

CALIFORNIA.

Temperature.—The mean was 0.8 below the normal; maximum, 83, at Indio, 28th; minimum, -22, at Boca, 6th; greatest monthly range, 61, at Tehachapi; least monthly range, 18, at Point Lobos.

Precipitation.—The average was 0.51 above the normal; greatest monthly, 27.56, at Upper Mattole; least monthly, trace, at Keeler.

Wind.—Prevailing direction, west.—J. A. Barwick, Observer, Weather Bureau, Sacramento, director.

COLORADO.

Temperature.—The mean was 2.0 above the normal; maximum, 80, at Downing, 15th and 17th; minimum, -35, at Gunnison, 19th; greatest monthly range, 95, at Downing; least monthly range, 47, at Watkins.

Precipitation.—The average was 0.25 below the normal; greatest monthly, 4.83, at Climax; least monthly, 0.00, at Canyon City, Las Animas, and Watkins.

Wind.—Prevailing direction, west.—J. J. Gilligan, Observer, Weather Bureau, Denver, director.

FLORIDA.

Temperature.—The mean was 1.5 above the normal; maximum, 85, at Plant City, 8th; minimum, 27, at Pensacola, 26th; greatest monthly range, 53, at Plant City; least monthly range, 19, at Key West.

Precipitation.—The average was 0.09 below the normal; greatest monthly, 4.35, at Titusville; least monthly, 0.46, at Manatee.

Wind.—Prevailing direction, northeast.—E. R. Demain, Observer, Weather Bureau, Jacksonville, director.

GEORGIA.

Temperature.—Maximum, 79, at Darien, 6th, 13th, and 17th, at Fleming,

5th, at Poulan, 7th, at Columbus, 16th; minimum, 16, at Adairsville and Lafayette, 25th; greatest monthly range, 60, at Darien and Lawrenceville; least monthly range, 40, at Lafayette and Toccoa.

Precipitation.—Greatest monthly, 6.76, at Dahlonega; least monthly, 0.75, at Brag.

Wind.—Prevailing direction, east.—Park Morrill, Local Forecast Official, Weather Bureau, Atlanta, director.

IDAHO.

Temperature.—Maximum, 62, at Nampa, 15th; minimum, -26, at Lake, 23d.

Precipitation.—Greatest monthly, 8.50, at Fort Sherman; least monthly, 0.30, at Oakley.

Wind.—Prevailing direction, southwest.—J. H. Smith, Observer, Weather Bureau, Idaho Falls, director.

ILLINOIS.

Temperature.—The mean was 7.0 above the normal; maximum, 73, at Griggsville, 17th; minimum, -26, at Dixon, 25th.

Precipitation.—The average was 0.11 below the normal; greatest monthly, 3.09, at Carlinville; least monthly, 1.05, at Bushnell.

Wind.—Prevailing direction, south.—John Craig, Observer, Weather Bureau, Springfield, director.

INDIANA.

Temperature.—The mean was 7.7 above the normal; maximum, 68, at Marengo, 17th; minimum, -17, at Lafayette; greatest monthly range, 73, at Lafayette and Marengo; least monthly range, 59, at Angola.

Precipitation.—The average was 0.63 below the normal; greatest monthly, 4.10, at Huntingburg; least monthly, 1.29, at Hammond.

Wind.—Prevailing direction, southwest.—Prof. H. A. Huston, Lafayette, director; C. F. R. Wappenhans, Local Forecast Official, Weather Bureau, assistant.

IOWA WEATHER AND CROP SERVICE.

Temperature.—The mean was 3.0 above the normal; maximum, 85, at Centerville, 21st; minimum, -37, at Ames, 25th; greatest monthly range, 112, at Centerville; least monthly range, 68, at Algona.

Precipitation.—The average was 0.26 below the normal; greatest monthly, 2.24, at Keokuk; least monthly, 0.31, at Humboldt.

Wind.—Prevailing direction, northwest.—J. R. Sage, Des Moines, director; G. M. Chappel, Local Forecast Official, Weather Bureau, assistant.

KANSAS.

Temperature.—The mean was 2.1 above the normal; maximum, 77, at Englewood, 16th; minimum, -26, at Achilles and Colby, 24th; greatest monthly range, 100, at Achilles; least monthly range, 80, at Cawker City.

Precipitation.—The average was 0.14 below the normal; greatest monthly, 3.45, at Sedan; least monthly, trace, at several stations.

Wind.—Prevailing direction, south.—T. B. Jennings, Observer, Weather Bureau, Topeka, director.

KENTUCKY.

Temperature.—The mean was 4.9 above the normal; maximum, 78, at Franklin, 24th; minimum, -12, at Pellville, 25th; greatest monthly range, 83, at Franklin; least monthly range, 58, at Catlettsburg.

Precipitation.—The average was 1.27 below the normal; greatest monthly, 4.30, at Caddo; least monthly, 1.56, at Carrollton.

Wind.—Prevailing direction, southwest.—Frank Burke, Local Forecast Official, Weather Bureau, Louisville, director.